

REMARKS

Prior to entry of this amendment, claims 1-63 are pending in the subject application.

By this amendment, claim 1 and the specification are amended and non-elected claims 15-63 are withdrawn. Claim 1 is the sole pending independent claim. No new matter is added. Support for the amendment to claim 1 may be at least found in FIG. 9 of applicants' originally filed specification. The specification is amended solely to correct a minor informality contained therein.

Applicants appreciate the Examiner's acknowledgement of applicants' claim for foreign priority and receipt of a certified copy of the priority document. Applicants further appreciate the Examiner's consideration of applicants Information Disclosure Statements filed December 10, 2003.

Applicants request, in the next Office action, that the Examiner indicate the acceptability of the drawings filed on December 10, 2003.

A. Introduction

In the outstanding Office action, the Examiner rejected claims 1, 6, and 9-11 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,448,590 to Adkisson et al. ("the Adkisson et al. reference"); rejected claims 1, 6, 9-11, 13 and 14 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,371,024 to Hieda et al. ("the Hieda et al. reference") in view of U.S. Patent No. 6,150,219 to Tung ("the Tung reference"); rejected claims 2, 3, 7, 8 and 12 under 35 U.S.C. § 103(a) as being unpatentable over the Adkisson et al. reference; and rejected claims 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over the Hieda et al. reference in view of U.S. Patent No. 6,677,209 to Farrar ("the Farrar reference").

B. Applicant Initiated Interview Summary

On June 27, 2006, an applicant initiated interview was conducted. Applicants appreciate the courtesies extended to applicants' representative by Examiner Nguyen during the June 27, 2006 personal interview. As required by 37 C.F.R. § 1.133(b), applicants' summary of that interview is as follows:

1. Brief Description of any Exhibit Shown

No exhibit was shown or demonstrated during the June 27, 2006 interview.

2. Identification of the Claims Discussed

The Examiner and applicants' representative discussed independent claim 1.

3. Identification of the Specific Prior Art Discussed

The Examiner and applicants' representative discussed the Adkisson et al. reference, the Hieda et al. reference, the Tung reference and the Farrar reference.

4. Identification of Proposed Amendments

Claim 1, as amended in the above listing of the claims, was proposed to the Examiner during the June 27, 2006 personal interview.

5. Summary of the Arguments Presented to the Examiner

Applicants representative presented arguments regarding the failure of the Adkisson et al. reference, the Hieda et al. reference, the Tung reference and the Farrar reference to disclose the subject matter of independent claim 1. More specifically, applicants' representative asserted that the Adkisson et al. reference, the Hieda et al. reference and the Tung reference fail to disclose or suggest a self-aligned inner gate recess channel in a semiconductor substrate including, *inter alia*, recess inner sidewall spacers that extend below an upper surface of the substrate a majority of a distance that the source/drain region extends below the upper surface and only a portion of a

distance that the gate extends below the upper surface, and which are sandwiched between the source/drain region and the gate, as recited in claim 1.

6. General Outcome of the Interview

An agreement between the Examiner and applicants' representative was reached. In particular, it was agreed that the claim 1, as amended in the above listing of the claims, overcomes the rejections of the claims over the Adkisson et al. reference, the Hieda et al. reference, the Tung reference and/or the Farrar reference.

C. Asserted Anticipation Rejection of Claims 1-3, 5 and 6

In the outstanding Office action, the Examiner rejected claims 1, 6, and 9-11 under 35 U.S.C. § 102(b) as being anticipated by the Adkisson et al. reference. The rejection is respectfully traversed for at least the following reasons.

The Adkisson et al. reference fails to disclose or suggest the combination of features now recited in independent claim 1 including, *inter alia*:

a gate formed in the recess trench so that an upper portion of the gate protrudes above an upper surface of the substrate, wherein a thickness of the recess inner sidewall spacers causes a center portion of the gate to have a smaller width than the protruding upper portion and a lower portion of the gate the recess inner sidewall spacers extending below an upper surface of the substrate a majority of a distance that the source/drain region extends below the upper surface and only a portion of a distance that the gate extends below the upper surface, and being sandwiched between the source/drain region and the gate.

As shown in FIG. 11, in the Adkisson et al. reference, the oxide 64 completely surrounds portions of the gate 62, which are not covered by the contact 66, and the spacer nitride 78 only overlaps with the silicide layer 70. For at least these reasons, applicants submit that the Adkisson et al. reference fails to disclose or suggest all the features of

claim 1, as well as all the features of claims 2, 3, 5 and 6, which directly or indirectly depend from claim 1. It is respectfully requested that the rejection be withdrawn.

D. Asserted Obviousness Rejection of Claims 1, 6, 9-11, 13 and 14

In the outstanding Office action, the Examiner rejected claims 1, 6, 9-11, 13 and 14 under 35 U.S.C. § 103(a) as being unpatentable over the Hieda et al. reference in view of the Tung reference.

Page 5 of the Office action acknowledges that the Hieda et al. reference fails to disclose recess inner sidewall spacers, as recited in claim 1 and asserts that the Tung reference discloses such features of claim 1.

Applicants respectfully submit that the combination of the Hieda et al. reference and the Tung reference fails to disclose or suggest the combination of features now recited in independent claim 1 including, *inter alia*:

a gate formed in the recess trench so that an upper portion of the gate protrudes above an upper surface of the substrate, wherein a thickness of the recess inner sidewall spacers causes a center portion of the gate to have a smaller width than the protruding upper portion and a lower portion of the gate the recess inner sidewall spacers extending below an upper surface of the substrate a majority of a distance that the source/drain region extends below the upper surface and only a portion of a distance that the gate extends below the upper surface, and being sandwiched between the source/drain region and the gate.

As shown in FIG. 2G, the vertical oxide layer 230 of the Tung reference extends to and beyond the gate oxide layer 240. For at least these reasons, applicants submit that the combination of the Hieda et al. reference and the Tung reference fails to disclose or suggest all the features of claim 1, as well as all the features of claims 6, 9-11, 13 and 14, which directly or indirectly depend from claim 1. It is respectfully requested that the rejection be withdrawn.

E. Asserted Obviousness Rejection of Claims 2, 3, 7, 8 and 12

In the outstanding Office action, the Examiner rejected claims 2, 3, 7, 8 and 12 under 35 U.S.C. § 103(a) as being unpatentable over the Adkisson et al. reference. The rejection is respectfully traversed for at least the following reasons.

As discussed above, the Adkisson et al. reference fails to disclose or suggest the combination of features recited in claim 1, from which claims 2, 3, 7, 8 and 12, directly or indirectly depend. For at least the reasons discussed above, applicants submit that the Adkisson et al. reference fails to disclose or suggest all the features of claims 2, 3, 7, 8 and 12. It is respectfully requested that the rejection be withdrawn.

F. Asserted Obviousness Rejection of Claims 4 and 5

In the outstanding Office action, the Examiner rejected claims 4 and 5 under 35 U.S.C. §103(a) as being unpatentable over the Hieda et al. reference in view of the Farrar reference. The rejection is respectfully traversed for at least the following reasons.

As discussed above, the Hieda et al. reference fails to disclose or suggest the combination of features recited in claim 1, from which claims 4 and 5, directly or indirectly depend. For at least the reasons discussed above, applicants submit that the Hieda et al. reference fails to disclose or suggest all the features of claims 4 and 5. Applicants submit that the Farrar reference fails to overcome the deficiencies of the Hieda et al. reference, as applied to claim 1. For at least these reasons, applicants submit that the combination of the Hieda et al. reference and the Farrar reference fails to disclose or suggest all the features of claims 4 and 5. It is respectfully requested that the rejection be withdrawn.

G. Rejoinder of Non-Elected Claims

Upon the allowance of independent product claim 1, under M.P.E.P. § 821.04 applicants respectfully request rejoinder of non-elected independent process claims 15 and 39, which are directed to a process of making the product recited in claim 1. Upon the allowance of independent claims 15 and 39, dependent process claims 16-38 and 49-63, which respectively depend therefrom, will also be in condition for allowance.

H. Conclusion

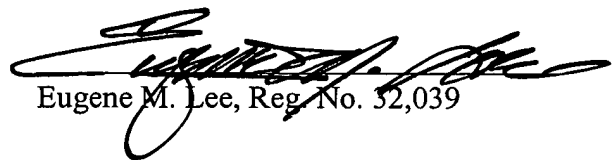
If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & MORSE, P.C.

Date: June 29, 2006


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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.